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Following William Thomson's calculation in 1901 of the Milky Way radius [9] and J. C. Kapteyn's announcement [5] at the Congress of Science and Arts during the World's Fair in Saint Louis of his discovery of two star-streams (1904), Henri Poincaré realized the interest of kinetic gas theory for modeling astronomical and cosmological phenomena. Soon others followed, including A. S. Eddington and Karl Schwarzschild, who proposed dualist and unitary models, respectively, of the observed stellar velocities. Eddington [1] affirmed Kapteyn's two-stream hypothesis on the basis of his analysis of the Groombridge stars, and claimed the streams were characterized by Maxwellian distributions with different constants. Shortly thereafter, Schwarzschild [8], on the basis of a different dataset, affirmed that there were not two star-streams but rather an ellipsoidal velocity distribution. The two models were judged at first to represent the data equally well, and further efforts were called for to determine which was best.

What Eddington and Schwarzschild provided in 1906–1907 were mathematical representations of empirical data. Neither Eddington nor Schwarzschild took up Poincaré's suggestion that the Milky Way was undergoing a rotation [6], at least not explicitly. Poincaré developed this bold conjecture in his Sorbonne lectures of 1910–1911 [7], the publication of which constituted the first theoretical treatise on cosmology. Notably, in his treatise Poincaré derived the virial for the case of a gaseous mass with Newtonian attraction, and took up the mixing problem. Like Poincaré, James Jeans challenged belief in the stationary state of the universe, based on his calculation of the angle of deflection of colliding stars [4]. A "stargas" (Sterngas) model of globular nebulae was investigated by Einstein in 1921 using Poincaré's virial, presumably as a way to fix the value of the cosmological constant he had introduced in 1917 to the field equations of general relativity [2], and to obtain thereby an estimate of the size of the universe [3].

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